February 2, 2004

MEMORANDUM TO: L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: John G. Lamb, Project Manager, Section 1 ***/RA/***
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: MEETING SUMMARY BETWEEN THE NUCLEAR REGULATORY COMMISSION STAFF AND STAKEHOLDERS CONCERNING GENERIC SAFETY ISSUE (GSI) 191, "ASSESSMENT OF DEBRIS ACCUMULATION ON PWR [PRESSURIZED-WATER REACTOR] SUMP PERFORMANCE" (TAC NO. MA6454)

On January 8, 2004, the Nuclear Regulatory Commission (NRC) staff met with the Nuclear Energy Institute (NEI), utility groups, and other stakeholders at NRC Headquarters concerning Generic Safety Issue (GSI) 191, "Assessment of Debris Accumulation on PWR [Pressurized-Water Reactor] Sump Performance." Attachment 1 lists the meeting attendees. A public meeting notice was issued on December 17, 2003, and was posted on the NRC's external (public) web page (ADAMS Accession No. ML033460414). The notice included the meeting agenda.

The purpose of the meeting was to discuss the chemical effects test plan and potential test facilities that will be used to conduct the tests regarding GSI-191.

This was a Category 2 Meeting. The public was invited to participate in the meeting by discussing regulatory issues with the NRC at a designated point identified on the agenda.

The overall agenda for this meeting consisted of (1) introductions, (2) comments by the NRC staff on the chemical effects test plan (Attachment 2), (3) a general discussion between the NRC, NEI, and utility groups on the chemical effects test plan, (4) comments by the NRC's Office of Nuclear Regulatory Research (RES) on potential chemical effects test facilities, (5) a general discussion between the NRC staff, NEI, and utility groups on the potential chemical effects test facilities, and (6) questions from stakeholders.

The NRC staff commented on the industry's proposed chemical effects testing. According to a draft of the industry's proposed test plan, an experimental apparatus will be used to simulate certain conditions in the containment following a loss-of-coolant-accident (LOCA). The draft of the industry's proposed test plan will have "coupons" in the containment section of the apparatus. The proposed coupons will react with the simulated containment environment and will be made up of the various metals and materials that are found inside the containment. The coupons in the draft of the industry's proposed test plan will be subjected to a series of tests and then examined to determine the chemical effects.

The NRC staff provided comments on the industry's proposed test plan pertaining to:

- what types of metals and other materials need to be tested for chemical effects
- the types of conditions that should be checked
- proper scaling
- test system cleanliness
- how weight-loss measurements will be performed on the test coupons
- whether debris generated in the zone of influence around the pipe-break should be included in the testing
- the duration of the test
- the number of times the test should be conducted in order to get sufficient data to determine if chemical effects needs to be considered when licensees address the sump blockage issue

The NRC staff also discussed three "Request for Information" areas: (1) the basis of the industry test plan, (2) Three Mile Island (TMI) insight, and (3) the NEI survey. The NRC staff requested background information and a list of assumptions regarding the industry test plan. The NRC staff also requested information and insight into the TMI gelatinous material, as well as the Susquehanna River water analysis at the time of the TMI accident. The NRC staff requested information from the NEI survey (i.e., pool depth and volume, pH control, a list of insulation materials, and surface areas for carbon steel, zinc, and aluminum following a LOCA).

The NRC staff presented its "Draft NRC Test Plan for Integrated Chemical Effects" (Attachment 3). The NRC staff's intention is combine its test plan and the industry's proposed test plan into a single test plan using the best elements of both test plans. The mechanics of the NRC's test plan are similar to the industry's proposed test plan, but the NRC's test plan includes more clearly defined steps to determine, based on computer modeling, which materials within the containment would be more likely to undergo a chemical reaction during a LOCA. Representatives of NEI's sump task force agreed to incorporate the NRC staff's comments and the NRC staff's draft test plan and combine the best ideas into one comprehensive test plan. NEI did not provide a tentative schedule for completing the new version of the comprehensive, combined chemical effects test plan.

The overall test objectives of the NRC's chemical effects test plan raised a great deal of discussion between the NRC staff and the industry. The NRC staff's proposed test plan objective stated that the testing would be held "to determine whether gelatinous chemical reaction products may develop in representative post-LOCA environment, and if developed, whether it will exacerbate sump blockage." However, NEI commented that the primary objective of the chemical effects test plan to calculate how the presence of gelatinous material would contribute to sump blockage could complicate the testing procedures. The NRC staff agreed to reword the objective so that the primary objective is to determine whether gelatinous

material can be formed and transported. Additionally, the NRC staff indicated that the secondary objective is to determine the gelatinous material's effect on sump blockage.

Regarding possible chemical effects test facilities, the industry presented information regarding the "ELISA Loop," located in Slovakia (Attachment 4). The industry noted that the Elisa Loop was used by France's Institut de Radioprotection et de Surete Nucleaire (IRSN) [Institute of Radiological Protection and Nuclear Safety]. The IRSN is the technical support organization for the French nuclear regulatory organization Direction Generale de la Surete Nucleaire et de la Radioprotection (DGSNR) [Director General of Nuclear Safety and Radiological Protection]. The IRSN has used the Elisa loop in its efforts to address the sump blockage issues for the PWRs in the Electricite de France. The industry indicated that the Elisa loop could be ready for testing in a few weeks, provided that agreements could be reached with the IRSN.

The NRC staff presented a "Sump Testing Facility Comparison" (Attachment 5) regarding the potential test facilities for chemical effects tests.

The NRC staff noted seven potential test facilities that were being explored, including:

- Ohio State University
- Purdue University/University of Missouri-Rolla
- Penn State University
- Oregon State University
- Los Alamos National Laboratory (LANL)/University of New Mexico
- Southwest Research Institute
- Elisa Loop

Penn State University, LANL/University of New Mexico, and the Elisa Loop have existing facilities. The LANL/University of New Mexico test facility would have to be modified to accommodate pressurized tests. For the other potential test facilities, new testing apparatus would need to be constructed. The NRC staff did not offer a schedule on when a decision would be made to select a facility because a contract would have to be developed. The contract would entail how the costs would be split between the NRC and the industry, as well as an agreed upon chemical effects test plan. Additionally, the NRC staff did not offer a schedule on when the chemical effects testing would be completed.

After the formal presentations given by the NRC staff and the industry, members of the public were invited to ask questions. One individual from the Union of Concerned Scientists asked questions.

In closing the meeting, the NRC staff notified the participants of the NRC Public Meeting Feedback form and encouraged them to complete the form and mail it into the NRC.

Attachments:
1. Meeting Attendees
2. “NRC Comments on the Industry Test Plan and Request for Information”
3. “Draft NRC Test Plan for Integrated Chemical Effects”
4. “ELISA Loop”
5. “Sump Testing Facility Comparison”

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ADAMS Accession Nos. ML040140593 (Meeting Summary)
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ML040160804 (Attachment 3)
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LIST OF ATTENDEES
MEETING REGARDING GENERIC SAFETY ISSUE 191,
"ASSESSMENT OF DEBRIS ACCUMULATION ON PWR SUMP PERFORMANCE"
THURSDAY, JANUARY 8, 2004

NAME	TITLE	ORGANIZATION
J. Lamb	Project Manager	NRC/NRR/DLPM
M. Marshall	Sr. Project Manager	NRC/NRR/DLPM
L. Raghavan	Section Chief	NRC/NRR/DLPM
M. Johnson	Deputy Director	NRC/NRR/DSSA
R. Architzel	Sr. Reactor Eng.	NRC/NRR/DSSA
J. Hannon	Branch Chief	NRC/NRR/DSSA
S. Weerakkody	Section Chief	NRC/NRR/DSSA
R. Elliott	Technical Assistant	NRC/NRR/DSSA
A. Lavieete	Engineer	NRC/NRR/DSSA
L. Lund	Section Chief	NRC/NRR/DE
M. Murphy	Engineer	NRC/NRR/DE
K. Parczewski	Engineer	NRC/NRR/DE
P. Klein	Engineer	NRC/NRR/DE
B. Kemper	Technical Investigator	NRC/OIG
M. Evans	Branch Chief	NRC/RES/DET
A. Hsia	Section Chief	NRC/RES/DET
T. Y. Chang	Project Manager	NRC/RES/DET
A. Csontoe	Engineer	NRC/RES/DET
W. Krotiuk	Engineer	NRC/RES/DSARE
*B. Letellier	Engineer	Los Alamos National Lab
R. Johns	Engineer	Los Alamos National Lab
J. Butler	Sr. Project Manager	Nuclear Energy Institute
T. Andreychek	Principal Engineer	Westinghouse
M. Dingler	Engineer	WCNOC/WOG
D. Lochbaum	Engineer	Union of Concerned Scientists
G. Twachtman	Reporter	McGraw-Hill
G. Zigler	Sr. Engineer	Alion Science & Technology
J. Russell	Project Manager	Southwest Research Institute
G. Vine	Project Manager	EPRI
*J. Walker	Project Manager	Framatone
J. Grant	Engineer	PSEG Nuclear
D. Raleigh	Client Mgr.	Lis. Scientech
J. Gisclom	Project Manager	EPRI

*Participated via teleconference

NRR = Office of Nuclear Reactor Regulation
DLPM = Division of Licensing Project Management
DSSA = Division of Systems Safety and Analysis
DE = Division of Engineering
RES = Office of Nuclear Regulatory Research
DET = Division of Engineering Technology
DSARE = Division of Systems Analysis and Regulatory Effectiveness
OIG = Office of the Inspector General

ATTACHMENT 1